

Physicist Resource Study Group

Status

origins

Following last spring's discussion

- *There was sufficient interest in better understanding the capabilities of HEP grants to operate our experiments over the next few years*

A “study group” was formed and charged by Fred Gilman

Physicist Resource Study Group:

Bill Molzon

Young-Kee Kim

John Womersley

Howard Gordon

Glen Crawford

Sekhar Chivukula

Joel Butler

Usha Mallik

Chip Brock

Jim Whitmore

charge, 7/18/04

Formation of a Working Group to Study HEP Physicist Resources

Following the discussion at the last HEPAP meeting, a Working Group is being formed to assess the question: Does the field have the manpower to carry out the experiments to which the U.S. program is committed until the end of the decade? The members of the Working Group will be drawn from both the HEP community and the agencies, DOE and NSF.

To answer the question at hand, each university and laboratory group will be requested to give its plan for the distribution of faculty/staff/postdocs/students among the various projects with which they are involved for each year through 2009. The funding assumption is constant level of effort, starting with 2004 as the base year.

These data will be compared with those supplied by the relevant collaborations, who will each be asked for their minimum year-by-year manpower needs. In addition, for on-shore experiments, their year-by-year expected U.S. and non-U.S. contributions will be requested.

An initial report from the Working Group will be presented to HEPAP at its meeting on September 23-24, 2004.

The philosophy:

these two sets of numbers might best bracket a reasonable expectation

...a systematic error band

activities

Preparation for PI's/Spokespeople:

- *Separate letters*
- *Separate sets of Excel workbooks*
 - each containing fastlane-like yellow fields to fill in*
 - each containing fictional examples*
 - *asked for response by 30 September*

Back and forth with the committee

- *letters, spreadsheet design, experiments were discussed electronically with committee over 3-4 weeks*

236 (E)mailings

- *sent to lists of all HEP PI's from NSF EPP and DOE OHEP groups*
- *sent to selected list of experiments*

Devoted email address

- *hepexp@pa.msu.edu*
- *MSU staff assistance in sorting, saving, counting replies*

FAQ website established to react to questions

www.pa.msu.edu/file_sharing/FAQ_survey.htm

FAQ for the HEPAP Physicist Resource Survey

updated 9/22/04, [brock](#)

| [NSF/DOE grant PI's](#) | [experimental spokespersons](#) |

FAQ: NSF/DOE grant PI's

1. [What assumptions are we to make about the approval of projects such as BTeV and Linear Collider when projecting manpower allocation to 2009?](#)
2. [In our University \(also for most Universities\) faculty are funded 9 months by the University \(off-base\) and 2 months \(on base\). Your example assumes faculty are funded all from on-base. Is there such a University? Anyhow since you are asking fraction of effort on base only, that is in our case 18% of FTE. So what are you requesting? It is unclear.](#)
3. [Graduate students who work on analysis of data. In your Issues analysis of experiment is clearly identified. In the GS line data analysis \(in the parenthesis area\) is singled out. Why? How do you want us to respond.](#)
4. [I received a request for a survey. Our group in HEP \(supported by DOE\) works only on theoretical physics. Your survey makes no mention of theorists, so I assume you expect me to fill in 0 in all entries, or do not answer the survey?](#)
5. [Should we count undergraduates in the survey?](#)

FAQ: experimental spokespersons

1. [Do you distinguish between Post Docs and Senior Research Associates or Research Faculty?](#)

FAQ: NSF/DOE grant PI's - responses:

1. What assumptions are we to make about the approval of projects such as BTeV and Linear Collider when projecting manpower allocation to 2009?

We suggest that we consider BTeV as an approved experiment and treat LC as still a project receiving only R&D support.

[back](#)

2. In our University (also for most Universities) faculty are funded 9 months by the University (off-base) and 2 months (on base). Your example assumes faculty are funded all from on-base. Is there such a University? Anyhow since you are asking fraction of

PI's & Spokespeople letters

identical formats:

- *common introductions*

August 24, 2004

Dear PI/contact person

We have a rich physics program involving two categories of experiments during the 2004-2009 timeframe: those either currently running or those coming on line. These experiments involve considerable public investment and literally thousands of person-years and it is essential that we plan to fulfill these obligations through to publication of physics results. The first step to developing such a plan is a careful understanding of our physicist resources.

Accordingly, at the April 2004 HEPAP meeting, a basic question was asked: “Does the field have the people to adequately carry out the experiments to which it is committed until the end of the decade?”

In order to address this question, Fred Gilman, Chair of HEPAP, has formed a Working Group to consider this matter, with Chip Brock and Jim Whitmore designated as co-chairs. The following is the charge to this group:

followed by the charge ...

followed by specific instructions

PI's detailed instructions

Issues:

- 1) For this survey, we are only interested in personnel who appear in the mastheads of publications and contribute to the maintenance, operations and/or analysis of experiments. Definitions of FTE for
Faculty (Fac): enter the fraction of the person's RESEARCH time;
Research Scientist (RS): enter the fraction of the person's TOTAL time;
Postdoc (PD): enter the fraction of the person's TOTAL time (realizing that part of their activities will likely be data analysis);
Graduate Student (GS): enter the fraction of the person's TOTAL time (realizing that part of their activities will likely be data analysis);
- 2) IF you have strong reasons to change the assumption of constant level of effort (eg a new faculty member coming in a particular year), please state your reasons.
- 3) Note that the first year of this survey is an accounting of your current effort and as such are presumably precise numbers. Since the strategy for the survey is "constant effort," the sum of each category of personnel is expected to remain equal to the FY2004 totals (although see note 4) through the FY2005-2009 period. Please estimate the split among projects with the realization that the accuracy may only be at the level of ± 0.5 FTE.
- 4) Since there may be cases where you wish to change FTEs between categories, for this study please use the following conversions: 2 postdocs = 1 Research Scientist or 1 other; and 2 graduate students = 1 postdoc. While these are not intended as direct financial equivalents, they may be useful guides for converting effort between classes of individuals.
- 5) Please include physicist efforts on both accelerator experiments as well as non-accelerator projects (eg CDMS, GLAST...). In addition, please include past (eg analysis continuing), current and future projects.
- 6) Finally, since there are personnel funded in some groups that receive support from "off-base" funds (such as project funds, funding from your Department or from your State, etc), please identify the number and type of such people supported in your group for FY2004. We do not ask you for future commitments of this type in future years. These personnel should be listed as "Others" and will only appear in the 5th line of Table 2 in the spread-sheet.

PI's - example

To date:

DOE groups: 22 (18%) out of 122

NSF groups: 15 (23%) out of 79

An example from a hypothetical group: University XYZ has 3 faculty members who are working on three projects: D0, CMS and SNAP.

One is currently on D0, but expects to phase into CMS slowly.

Another is currently on D0 and expects to phase into SNAP, while the third is on D0 and CMS, and expects to continue at the 50-50 level through FY2009.

Since their Research Scientist will retire at the end of FY2005 they will fund an additional two postdocs starting in FY2006.

They currently have 3 postdocs in the group. They have an Electronics Technician supported through their base funding.

For FY2004, they also have a computer/software expert funded through the CMS project funds for FY04. There is no guarantee this continues.

1	Institution:	University XYZ
	Contact Person:	A.N. Other (another@xyz.edu)
	Funding agency(ies)	DOE, NASA
	Projects working on between now (FY2004) and FY2009 (A, B,):	
	A	D0
	B	CMS
	C	SNAP

2	Numbers of current personnel in each category	Funded in FY04 from base	Funded in FY04 from off-base	Type of person
	Faculty	3	0	
	Research scientists	1	0	
	Postdocs	3	0	
	Graduate Students	4	0	
	Others (identify type of person)	1	0	E. technician
	Others (identify type of person)	0	1	S/W professional

3	Estimated number of FTE personnel working on each project in each category in each year (only from base funding):						
	Faculty	FY2004	2005	2006	2007	2008	2009
	D0	2.5	2.1	1.7	1.3	0.9	0.5
	CMS	0.5	0.7	0.9	1.1	1.3	1.5
	SNAP	0.0	0.2	0.4	0.6	0.8	1.0
	Sums	3.0	3.0	3.0	3.0	3.0	3.0
	Research Scientists	FY2004	2005	2006	2007	2008	2009
	D0	1.0	1.0	0.0	0.0	0.0	0.0
	CMS	0.0	0.0	0.0	0.0	0.0	0.0
	SNAP	0.0	0.0	0.0	0.0	0.0	0.0
	Sums	1.0	1.0	0.0	0.0	0.0	0.0
	Postdocs	FY2004	2005	2006	2007	2008	2009
	D0	2.5	2.5	2.5	2.0	1.5	1.0
	CMS	0.5	0.5	1.5	2.0	2.5	3.0
	SNAP	0.0	0.0	1.0	1.0	1.0	1.0
	Sums	3.0	3.0	5.0	5.0	5.0	5.0
	Graduate students	FY2004	2005	2006	2007	2008	2009
	D0	4.0	4.0	3.0	2.0	1.0	0.0
	CMS	0.0	0.0	1.0	1.0	2.0	3.0
	SNAP	0.0	0.0	0.0	1.0	1.0	1.0

33 experiments solicited

At FNAL:

CDF
Dzero
BTeV
CKM
HyperCP (E871)
KTeV
NuTeV
MiniBoone
MINOS
MIPP (E907)
Minerva (E938)
NuSea (E866/906)
Nova (P929)
13

At SLAC

BaBar

1

At BNL

MECO

KOPIO

2

At Cornell

CLEO-c

1

Asia

Belle

K2K / SuperK

2

Europe

ATLAS

CMS

ZEUS - DESY

3

Other

Auger

GLAST

VERITAS

HiRes

Milagro

STACEE

SDSS (E885)

SNAP

CDMS

LIGO

IceCube

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Criteria for inclusion were roughly “approved experiment”
or consensus within the committee

Spokespeople's detailed instructions

Notes:

For this survey, we are only interested in physicist effort: personnel who appear in the mastheads of publications and contribute to the maintenance, Operations and/or Analysis of your experiment.

Definitions of FTE for

Faculty and Laboratory Scientists (Fac): enter the fraction of the person's RESEARCH time. Please break out faculty as sum total US University/Lab Scientist and non-US institution for 2004 only.

Postdoc and Research Scientists (PD): enter the fraction of the person's TOTAL time (realizing that part of their activities will likely be data analysis); Please break out post docs as university, non-US institution; and host laboratory for FY2004 only.

Graduate Student (GS): enter the fraction of the person's TOTAL time (realizing that part of their activities will likely be data analysis) Please break out graduate students as total US University and non-US institution for FY2004 only.

Uncertainty

This is a difficult exercise. Except for the FY2004 *census* (which should be nearly exact), extrapolation involves estimates of varying degrees of confidence. We hope that you can estimate to $\pm 10\%$ for Operations, at least.

EXP	A
Responder	your name (yourname@expA.lab)
date	9/1/04

ACTUAL	Personnel	FY 04	NEEDED	Personnel	FY 05	FY 06	FY 07	FY 08	FY 09
<i>operations</i>	FTE Fac -US institutions	0	<i>operations</i>	TOTAL FTE Fac	5	5			
	FTE host lab staff	5							
	FTE Fac/staff foreign institutes	0							
<i>operations</i>	FTE PD -US institution	7	<i>operations</i>	TOTAL FTE PD	12	8.5			
	FTE PD -host lab	0							
	FTE PD -foreign institutes	3							
<i>operations</i>	FTE GS -US institution	5	<i>operations</i>	TOTAL FTE GS	10	10			
	FTE GS -foreign institutes	5							
	TOTAL OPERATIONS	25		TOTAL OPERATIONS expected precision ±10%	27	23.5	0	0	0
<i>analysis</i>	FTE Fac -US institutions	25	<i>analysis</i>	TOTAL FTE Fac	40	40			
	FTE host lab physics staff	5							
	FTE Fac/staff foreign institutes	10							
<i>analysis</i>	FTE PD -US institution	7	<i>analysis</i>	TOTAL FTE PD	10	10			
	FTE PD -host lab	0							
	FTE PD -foreign institutes	3							
<i>analysis</i>	FTE GS -US institutions	10	<i>analysis</i>	TOTAL FTE GS	20	20			
	FTE GS -foreign institutes	10							
	TOTAL ANALYSIS	70		TOTAL ANALYSIS expected precision ±10%	70	70	0	0	0
<i>FTE checksum</i>	total faculty/staff	45	<i>FTE checksum</i>	total faculty/staff	45	45	0	0	0
<i>FTE checksum</i>	total PD	20	<i>FTE checksum</i>	total PD	22	18.5	0	0	0
<i>FTE checksum</i>	total GS	30	<i>FTE checksum</i>	total GS	30	30	0	0	0
<i>major tasks: 2005</i>	upgrade installation, which involves an increase in FTE post docs by 2								
<i>major tasks: 2006</i>	upgrade complete; calibration of new upgrade components								
<i>major tasks: 2007 - 2009</i>									

spokespeople - example

To date:

2 experiments have replied

1 experiment removed as “completed”

FY04: 100 total authors

40 faculty (the FTE measure is “research time,” presumed to be 50% of their clock time)

- split 30 US and 10 foreign
- 20 US and all foreign fac: full research-time on EXPT A
- 10 of US fac are 50-50 EXPT A + other experiment
- all fac are presumed to be full-time analysis
- so, the total fac FTE for EXPT A = 20+5+10 = 35

10 US lab physicists (FTE measure is “research time”)

- all lab staff: 50% analysis and 50% operations
- so, the total fac + lab staff FTE for EXPT A = 35+10 = 45

30 GS(FTE measure is clock time) (20 US, 10 foreign)

- 20 GS presumed to be 100% analysis (10 US, 10 foreign)
- 10 GS presumed to be 100% operations (5 US, 5 foreign)

20 post docs (FTE measure is clock time) (14 US; 6 foreign)

- all post docs are presumed to be 50% analysis
- all post docs are presumed to be 50% operations

FY05: needs

Include an upgrade to a detector component that will require equiv. additional FTE PD for “operations” for one full year. The analysis needs are presumed to be same as FY04.

FY06: needs

Commissioning of the upgrade: this only requires 1 FTE post doc. Since the new device will require less effort in maintenance than the old one (which required 2.5 FTE post docs), there will be a net reduction, compared to the FY2004 level, of 1.5 FTE post docs.

Analysis needs are presumed to have not changed from FY05.

plans/issues/philosophy

issues that we're working on:

- *manipulation of the data - Excel macro virtuoso?*
- *quality control of data - agency people probably know this best*
- *who prods? - need to remind*
- *schedule planning - will establish milestones*
- *use of the committee*
to help with consistency of data
and conclusions from the study

IF there is a personnel problem we presume

- 1. we presume it's likely to be post docs and graduate students*
the large experiments are graduating students now
the post doc pool will be diminished and untapped if we wait too long
- 2. we expect it's likely to be short term*
- 3. we hope we're prepared to fix it in a positive way*

We hope to have results by the next HEPAP meeting